FUNFALEK, AUGUSTIN

Czechoslovakia/Chemical Technology. Chemical Products and Their Application -- Food industry, I-28

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 6704

Author: Funfalek, Augustin

Institution: None

Title: Use of Nitrates in the Meat Industry

Original Publication: Prumysl potravin, 1955, 6, No 3, 122-127

Abstract: A review. Bibliography, 37 references. For the beginning see Referat Zhur - Khimiya, 1956, 2623.

Card 1/1

FUNFALEK A.

CZECHOSLOVAKIA / Chemical Technology. Chemical Products and Their Application - Food industry J-14

Abs Jour : Referat Zhur - Khimiya, No 2, 1958, 6311

Author : Funfalek Augustin

Inst : Not given

Title : Determination of the Density of Brine in the Meat Industry

Orig Pub : Prumysl potravin, 1957, 8, No 7, 377-379

Abstract : The substantial discrepancies are noted between determination results, due to the use of different kinds of areometers. A substantiation is provided for the necessity of determining, in brines, not only the NaCl content but also that of nitrites and nitrates. The inconsistency is pointed out between calibration of labroatory glassware at 20° and calibration of areometers at 15°.

Card 1/1

CZECHOSLOVAKIA/Chemical Technology - Elements, Oxides, Mineral Acids. Bases. Salts H.

Abs Jour : Ref Zhur - Khimiya, No 16, 1958, 54490

Author : Funfalek

Inst : -

Title : Granularity of Sodium Chloride Used in Food.

Orig Pub : Prumysl. potravin, 1957, 8, No 11, 572-573

Abstract : The varieties and the granulation size of the sodium chloride used in food is given. Their properties are examined in regards to hygroscopicity. Nine references are furnished.

Card 1/1

FUNTALEK, A.

Defects in ham.

P. 111 (Ministry of Health, Research Institute for Organization of Health Service) Vol. 12, No. 7/8, July/Aug. 1957.

SO: Monthly Index of East European Acessions (AEEI) Vol. 6, No. 11 November 1957.

COUNTRY : Czechoslovakia H-28
CATEGORY :

ABS. JOUR. : RZKhim., No.22 1959, No. 80231

AUTHOR : Funfalek, A. Augustin
INST. : Not given
TITLE : White Molds in Hard-Cured Meat

ORIG. PUB. : Prumysl Potravin, 9, No 4, 171-178 (1958)

ABSTRACT : The author has made a detailed study of the role of white molds in the production of hard-cured meats. White cultures of Penicillium candidum syn., P. camemberti var Rogeri Thom, and Scopulariopsis brevicaulis var alba Thom were used in the experiments. Conditions for the inhibition of the growth of cultures of the harmful green molds were investigated. The conditions for the production of raw-cured sausages by the use of white molds are examined. The bibliography lists 25 titles.

D. Yakesh

CARD: 1/1

[redacted], A.; [redacted], J.

Salt content in smoked food products. p. 533.

PRUMYSL POTRAVIN. (Ministerstvo potravinarskeho prumyslu)
Praha, Czechoslovakia Vol. 10, no. 10, Oct. 1959

Monthly List of East European accession, (EEAI), LC, Vol. 8, No. 12, Dec. 1959
Uncl.

FUNFALEK, Augustin

Industrial mushroom processing. Prum potravin 14 no.6:320-322 Je '63.

1. Druzstevni zavody Ustredniho svazu spotrebnich druzstev Mykroproducta, Praha.

FUNIKOV, A.V.

Sprayer with rotating atomizers. Zashch.rast.ot vred.i bol. 5 no.3:13 Mr '60. (MIRA 16:1)
(Spraying and dusting equipment)

FUNIKOV, A. V., kand. tekhn. nauk

Methods for estimating the distribution of poisons in spraying. Zashch. rast. ot vred. i bol. 5 no.10:43 O '60. (MIRA 16:1)

(Spraying and dusting in agriculture)

FUNIKOV, A.V., kand.tekhn.nauk; KONASHEVICH, V.A., inzh.

Simple method of estimating. Zashch. rast. ot vred. i bol. 8 no.9:42-43 S '63. (MIRA 16:10)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut Grazhdanskogo vozdushnogo flota.

S/264/62/000/006/006/008
I064/I242

AUTHOR: Funikov, A.

TITLE: Airplanes and helicopters in agriculture

PERIODICAL: Referativnyy zhurnal, Vozdushnyy transport. svodnyy tom. no.6A, 1962, 29, abstract 6A190 (Tekhn. v.s.kh., no.10, 1961, 49-50)

TEXT: A description, basic technical indications and apparatus for spraying and pollinating agricultural crops are given. The equipment is installed in АК - 12М (Ya K - 12M) and АН - 2 (An-2) airplanes and Ми - 1НХ (Mi - 1NKh) and Ka-15 helicopters.

[Abstracter's note: Complete translation.]

Card 1/1

DUNSKIY, V.F., kand. tekhn. nauk; FUNIKOV, A.F., kand. tekhn. nauk.

Tests for helicopters with aerosol generators. Zashch. rast. ot vred. i bol. 3 no.3:20-21 My-Je '58. (MIRA 11:6)
(Aeronautics in agriculture) (Aerosols)

FUNIKOV, A.V., kand.tekhn.nauk

Reducing the loss of chemicals in airplane dusting. Zashch. rast. ot vred. i bol. 5 no.1:14-15 Ja '60. (MIRA 14:6)
(Spraying and dusting) (Aeronautics in agriculture)

FUNIKOV, A.N., kand.tekhn.nauk; ZORINA, A.P., inzh.

Cleaning the pumping equipment of air-borne sprayers from the 2,4-D ester residues. Zashch. rast. ot vred. i bol. 6 no.5:34 My '61. (MIRA 15:6)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut Grazhdanskogo vozdushnogo flota.
(Spraying and dusting equipment—Maintenance and repair)

FUNIKOV, A.V., kand.tekhn.nauk

Improve the quality of aerial dusting. Zashch.rast.ot vred.i bol. 7 no.6:16 Je '62. (MIRA 15:12)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut Grazhdanskogo voyennogo flota.
(Aeronautics in agriculture) (Spraying and dusting)

FUNIKOV, N. (g. Aleksandrov, Vladimirskoy oblasti).

After the auditing. Prom. koop 12 no.6:24-25 Je '58.
(MIRA 11:6)

1.Starshiy bukhgalter arteli invalidov "Proletarskiy trud."
(Vocational rehabilitation)

Distr: 4E2c

Fine-mesh quartz grids. A. P. Novikov and N. P. Funikov. U.S.S.R. 108,133, Oct. 25, 1957. Quartz is sublimed *in vacuo* and condensed on a fine-mesh Cu grid. The quartz is then sintered in an inert gas and the Cu grid is removed with HNO_3. M. Hosen

FUNIKOV, S. A.

"Mechanizing the Work of Felling Timber," Torf. prom., 29, No.4, 1952

FUNIKOV, S. A.

"Mechnaical Method of Uprooting a Stump," Torf prom., 29, No.8, 1952

BAUSIN, A.F.; SOKOLOV, [redacted]A.; ANTONOV, V.Ya.; KURDYUMOV, [redacted]V.; BEL'KEVICH, P.I.; SAVINYKH, A.I.; KARAKIN, F.F.; SOLOPOV, S.G.; YEFIMOV, V.S.; YARIVITSIN, V.I.; RABKIN, B.A.; BABARIN, A.F.; MATVEYEV, L.M.; FUNIKOV, S.A.; CHERNENKOV, D.P.; BULAYEVSKIY, N.V.; kandidat tekhnicheskikh nauk; SHINKARINK, K.K.; TSUPROV, S.A.; GINZBURG, L.N.; VASIL'YEV, Yu.K.

Scientific and technical conference on the work of the peat industry of the Ministry of Electric Power Stations. Torf.prom. 32 no.2:1-20 '55. (MLRA 8:5)

1. Zamestitel' ministra elektrostantsiy (for Bausin). 2. Zamestitel' direktora VNIITP (for Sokolov). 3. Zamestitel' direktora MTI (for Antonov. 4.Zamestitel' direktor "'krniimesttopprom"(for Kurdyumov). 5. Direktor Instituta torfa AN BSSR(for Bel'kevich). 6. Nachal'nik Glavenergozapchasti MES(for Savinykh). 7. Glavnyy inzhener Ivanovskogo torfotresta (for Karakin). 8. Zamestitel' direktora MTI (for Solopov) 9. Upravlyayushchiy Shaturskogo torfotresta (for.Yefimov). 10. Glavnyy mekhanik Invanovskogo torfotresta (for Yarovitsin). 11. Glavnyy mekhanik Leningradskogo torfotresta (for Rabkin). 12. Glavnyy inzhener Ozeretsko-Neplyuyevskogo torfopredpriyatiya (for Babarin). 13. Glavnyy inzhener Gor'kovskogo torfotresta (for Matveyev). 14 Rukovoditel' laboratorii VNIITP (for Funikov). 15. Glavnyy inzhener tresta Lentorfostroy (for Chernenkov).

(Continued on next card)

S. A. Funikov, V. V. Pokamestov and L. M. Malkov (USSR)

"Complex mechanization of peat fields preparations "

Report submitted for the 2nd International Peat Congress, Leningrad, 15-22 Aug 63.

Funikova

Determination of the most important amino acids in foods. I. S. Yalchnikov, N. K. Florenskaya, and A. N. Funikova. *J. Appl. Chem. U.S.S.R.* 27, 533-6 (1954) (Engl. translation).—See *C.A.* 48, 9883*i*. B. M. R. MD

(2)

FUNIKOVA, A. N.

Determination of the most important amino acids in feeds. I. S. Yakhnikov, N. K. Florenskaya, and A. N. Funikova (Grain Inst., Moscow). *Zhur. Prikład. Khim.* 27, 570-2 (1954).—The following analytical results were obtained by the methods described previously by Pryanishnikov (*Uspekhi Zootekh. Nauk*, No. 2(1935)); Poramantir (*Vestnik Sel'skokhoz. Nauk* 4, 3(1940)), and Gorbacheva (*C.A.* 47, 6471e). The values are given in percentage of tryptophan, lysine, arginine, tyrosine, cystine, and histidine, resp.: oats 1.2, 7.64, 11.29, 3.6, 1.1, 4.71; bran 1.85, 2.1, 9.2, 3.2, 1.0, 2.40; flaxseed cake 1.13, 3.15, 9.37, 1.32, 1.03, 1.52; sunflower-seed cake 1.12, 3.09, 9.41, 2.17, 1.84, 2.0; cotton-seed cake 1.4, 3.80, 10.4, 0.56, 1.50, 1.68; vetch 0.81, 3.21, 9.9, 1.8, 1.07, 1.3. G. M. Kosolapoff

L 22090-66 EWT(m)/T/EWP(t) IJP(c) JD/JG

ACC NR: AP6012939 SOURCE CODE: UR/0070/65/010/001/0029/0031

AUTHOR: Azarkh, Z. M.; Funin, V. N.

ORG: none

TITLE: X-ray structural phase analysis of the scandium-hydrogen system

SOURCE: Kristallografiya, v. 10, no. 1, 1965, 29-31

TOPIC TAGS: scandium, hydrogen, x ray analysis, crystal lattice structure

ABSTRACT: Metallic scandium 99.8% pure was saturated with hydrogen by thermal activation, after which an x-ray structural analysis was made by the Debye method. There is a gradual increase in the hexagonal lattice constants with increase in hydrogen content. The maximum constants for the α-phase at 28 atomic percent hydrogen are a = 3.34 and c = 5.29 Å. At 30 atomic percent hydrogen the first lines of the cubic β-phase -- 111 and 113 -- appear. Then comes a two-phase region in which, with increase in the amount of hydrogen, the lines from the hexagonal phase gradually disappear, and the lines from the cubic phase become stronger. In the range from 62.5 to 67 atomic percent hydrogen a narrow homogeneous cubic β-phase region is observed. Under all conditions the cubic lattice period remains constant and has the value a = 4.781 Å. The lattice constants of the hexagonal and cubic phases are nearly the same as for zirconium. In showing a continuous increase in the constants of the α-phase, scandium differs from titanium and zirconium. The constants of the α-phase continue to

Card 1/2 UDC: 548.736

L 22090-66

ACC NR: AP6012939

increase even in the two-phase region. The maximum increase in volume of the unit cell of the α-phase is ~3%. For concentrations up to 67 atomic percent hydrogen no tetragonal distortions of the cell of the β-phase were observed. Orig. art. has: 3 figures. [JPRS]

SUB CODE: 20 / SUBM DATE: 01Apr64 / ORIG REF: 003 / OTH REF: 002

Card 2/2 BLG

FUNITSKIY, N. P.

PA 11/49T40

USSR/Electronics Aug 48
Voltage Regulators
Systems, Electric

"Accuracy of Amplidyne Regulation of Generator Voltage," Acad V. P. Nikitin, N. P. Funitskiy, 3 pp

"Dok Ak Nauk SSSR" Vol LXI, No 4

Proves that $\gamma = \frac{\delta}{k+1} = \frac{\delta}{\alpha_o}$, where γ characterizes accuracy of regulation (the larger γ, the lower the accuracy), δ = decrease of generator voltage, caused by increase of load, k = amplification factor of system, α_o = booster coefficient. Hence, shows that accuracy of regulator attainable in sys-

[redacted] 11/49T40

USSR/Electronics (Contd) Aug 48

tem with electric coupling is considerably higher than for a magnetic coupling. Submitted 29 May 48.

[redacted] 11/49T40

S/081/62/000/001/019/067
B156/B101

AUTHORS: Rautschke, R., Naumann, H., Funk, H.

TITLE: Spectrographic determination of niobium and tantalum in solutions

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 1, 1962, 145, abstract 1D81 (Acta chim. Acad. scient. hung. v. 28, nos. 1-3, 1961 103-109)

TEXT: The specimen being analyzed is converted into a solution by melting a weighed amount with 30 times the amount of dry $KHSO_4$ for 10 min; the melt is then dissolved in a 10% solution of tartaric acid. Alternatively a weighed batch is dissolved in HF (100 mg of HF per 1 g of solution). The tartaric acid solutions remain stable for 8-10 days; their Nb or Ta contents must not exceed 2.5 mg/ml. The solution is introduced into the discharge by means of a carbon disc rotating at 5 rpm. The depth to which the disc is immersed in the solution (2 mm) is controlled by a micrometer screw. The counter-electrode is a 5 mm diameter carbon rod ground to cone-shape.

Card 1/2

S/081/62/000/001/019/067
B156/B101

Spectrographic determination of niobium ...

To determine the Nb and Ta in the tartaric acid specimens, spectra are excited by high-voltage spark discharge (capacity 2400 μμF, inductance 1.5 mH, voltage 9.3 kv), and photographed with a Q-24 spectrograph, the gap between electrodes being 2 mm. Preliminary spark transfer time is 120 sec when determining Nb and 150 sec when determining Ta. Exposure times are 90 sec and 120 sec respectively. Spectrograph slot width is 0.014-0.015 mm.

The analysis line pairs are Nb 2927.8 - Ta 2933.5 Å and Ta 2400.63 - Nb 2398.73 Å. Analysis sensitivity is 0.1 γ/ml of Nb and 0.5 γ/ml of Ta. The mean error in determining Nb is ± 5.5%, the figure for Ta ± 6.5%. Standard solutions are prepared by dissolving pure Nb_2O_5 and Ta_2O_5. When analysing HF solutions, the spectra are excited by a discharge of capacity 12 000 μμF, inductance 0.08 mH, and voltage 12 kv. Before analysis, the carbon disc surfaces are impregnated with a solution of NaCl. The depth to which the disc is immersed in the solution is 4 mm. The mean error in determining Nb is ± 5.4%, the figure for Ta ± 4.3%. [Abstracter's note: Complete translation.]

Card 2/2

FUNK, K.

CZECHOSLOVAKIA/Chemical Technology - Chemical Products and Their Application, Part 2. - Ceramics, Glass, Binders, Concretes. - Ceramics. H-12b

Abs Jour : Ref Zhur - Khimiya, No 7, 1958, 22090

Author : K. Funk, O. Cizek
Inst : -
Title : Influence of Shard Introduction into China Masses on Results of Their Rational Analysis by Berdel's Method.

Orig Pub : Sklar a keramik, 1957, 7, No 10, 295-296

Abstract : Great divergences from the actual composition of masses are observed at laboratories of china-ware factories in Czechoslavakia at the rational analysis (RA) of china masses according to the Berdel's method (Sklar a keramik, 1952, No 9, 168). The cause of the inaccurate results of the PA is the introduction of the utility waste shards and, especially, of the highly burnt china shards into the masses. The amount of felspar determined according to the

Card 1/2

S/196/62/000/023/002/006
E194/E155

AUTHORS: Funk, Karel, Srnka, Osvald, Páv, Karel, Pašek, Libor, and Frkal, Antonín

TITLE: A method of fixing metal parts on porcelain with synthetic materials

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.23, 1962, 1, abstract 23 B 3 P. (Czech. pat. cl. 21 e, 13/01; 21 c, 13/10, no.99807, June 15, 1961)

TEXT: The adhesive patented consists of a liquid mixture of methyl-methacrylate and polymethyl-methacrylate with the addition of a tertiary amine as a catalyst. A filler may be added to the mixture, for example, coarse porcelain chips.

[Abstractor's note: Complete translation.]

Card 1/1

FUNK, R

'Bcs

Chemistry & Physics

2015. A study of the system Al_2O_3-Fe_2O_3-SiO_2.—H. NOWOTNY and R. FUNK (*Radex-Rdsch.*, No. 8, 334, 1951). The binary systems Al_2O_3-Fe_2O_3 and Fe_2O_3-SiO_2 were examined by X-rays; in the first case, formation of solid solns. on either side of the system was established whose miscibility limit has been ascertained at 1,000° C. and/or approx. 1,700° C. In the second case, the two oxides co-exist unchanged. The ternary system is determined by the phases appearing in the adjacent systems. No ternary cpd. was found, and the ferromagnetic a-Fe_2O_3 appeared repeatedly and was examined more closely. It has been revealed that the ferromagnetism originates in a-Fe_2O_3 that liberated some oxygen directly prior to transition into Fe_3O_4. This finding is in harmony with Neel's theory concerning ferromagnetic a-Fe_2O_3. The Curie points of the ferromagnetic tests measured, whose comps. lie partly within the binary systems Al_2O_3-Fe_2O_3 and Fe_2O_3-SiO_2, partly within the ternary system, confirm the structure established by X-ray. (6 figs., 2 tables.)

FUNK, R.

1

2

Crystal chemical studies in the systems Mn-As, V-Sb, Ti-Sb. H. Nowotny, R. Funk, and J. Pesl (Univ. Vienna). *Monatsh.* 82, 513-28(1951).—Mn_2As occurs in alloys contg. 50.8-72.5% Mn. Leaflike single crystals were isolated from the 73.5% alloy. The cell is pseudotetragonal orthorhombic, $a = b = 3.78_0$, $c = 10.2_4$ kX and contains 4 Mn_2As. The space group is D_{2h}^{11}, the 2*a* points for the 3 Mn lying at $z = 0.193_0$, -0.193_0, -0.434_4 and the As at $z = 0.400$; the corresponding 2*b* points are $z = 0.306_5$, -0.306_5, -0.065_5, 0.091. The shortest distances are Mn-Mn 2.71 and Mn-As 2.60 A. VSb of C16 type, isomorphous with TiSb, has an extraordinarily high calcd. d. of 5.13. $a = 0.54_6$, $b = 5.62_4$ kX; V—V 2.81, V—Sb 2.83, Sb—Sb 2.92 A. In an alloy contg. 61.0% Ti a Ti_2Sb phase can be identified. $a = 2a' = 5.946$, $c = 4.798$ kX, calcd. d. 5.66. The space group is DO_{18}, interat. distances 2.95 or 2.97 A., formula $Ti_4(Ti_{1.6}Sb_{0.4})$.

David Lewis

177T67

USSR/Medicine - Antibiotics Feb 51

"Therapeutic Properties of the Tea Fungus," V. S. Tinditnik, S. Ye. Funk, I. V. Sabinskaya Therapeutic Dept, Omsk Clinical Hosp for Water Transport Workers of the Lower Irtysh Basin

"Terap Arkhiv" Vol XXIII, No 1, pp 85-87

Extract of this fungus, used as popular medicine and beverage, was found to have bactericidal effect on streptococci and diplococci. It cured acute tonsillitis (Vincent's angina, lacunary, follicular, and catharral), chronic enterocolitis of gastrogenic origin, and small suppurating wounds of fingers and toes.

177T67

LEVKOV, A.A.; FUNK, V.I.; KATSNEL'SON, I.I.

Observations on Reiter's syndrome. Vest. derm. i ven. 34 no.7:68-70 '60. (MIRA 13:12)

(REITER'S DISEASE)

FUNK, Yu.G.

Role of alcohol in the course of gonorrhea. Vest.derm.i ven. no.9:59-61 '61. (MIRA 15:5)

1. Iz Gorodskoy ob"yedinennoy bol'nitsy Magnitogorska No.4 (glavnyy vrach M.Ya. Makarenko).
(GONORRHEA) (ALCOHOL--PHYSIOLOGICAL EFFECT)

FUNKA, Jaroslav (chirurg. odd. OUNZ v Humpolci)

Ischemic gangrene of the hand following a supracondylar fracture of humerus. Acta chir. orthop. traum. cech. 26 no.2:140-144 Mar 59.

1. Chirurgicke oddeleni nemocnice v Novem Meste na Morave, prednosta MUDr. J. Pospisilik.

(HUMERUS, fract.
ischemic gangrene of hand in supracondylar fract. (Cz))
(HAND, gangrene
in supracondylar fract. of humerus (Cz))

FUNKE, V. F.; BOGDANOV, N. A. ZHUKHOVITSKIY, A. A. (Prof., Dr. Chem. Sci.); REITBLATT, V. L. (Engr.):

"The Reflection of Beta Radiation and the Analysis of Metals," in book The Application of Radioisotopes in Metallurgy, Symposium XXXIV; Moscow; State Publishing House for Literature on Ferrous and Nonferrous Metallurgy, 1955.

Prof. A. A. ZHUKHOVITSKIY, Dr. Chem. Sci.; V. L. REITBLATT, Engr.; V. F. FUNKE, Assistant; N. A. BOGDANOV, Assistant/ Chair of Physical Chemistry; Chair of Rare Metals Metallurgy, Moscow Inst. of Steel im I. V. Stalin.

FUNKE V.F.

IRM

3041. **Analysis of chromium - niobium [and other] alloys by means of the intensity of reflection of γ-radiation.** N. A. Bogdanov and V. F. Funke (*Zavod. Lab.*, 1955, **21** [2], 181–183).—The sample of Nb - Cr alloy is placed on a Plexiglas diaphragm above a Geiger - Müller counter. Immediately below the sample is placed some radioactive ^{204}Tl on a lead support and a filter of aluminium foil, 90 mg per sq. cm, between this and the counter. The radiation reflected from the niobium atoms has a greater penetrating power through the filter than that from the chromium atoms. The samples for standards and for analysis are prepared from powders with a particle size of $< 0{\cdot}075$ mm, which are first stirred in alcohol for 48 hr. A layer 6 mm thick is placed in a mould, 20 mm in diameter, covered with tissue paper and compressed under a pressure of 3 tons per sq. cm. Only the reflected radiation is received by the counter; the Pb holds back the direct radiation from the ^{204}Tl. The composition of the standards ranges from 8·39 to 100 per cent. of Nb. The intensity of the radiation varies linearly with the content of Nb, which is determined from a calibration curve. The accuracy is $\simeq 2$ per cent.; the method is suitable for alloys containing > 3 per cent. of Nb, and the time required is 3 min. With Fe - W alloys, samples prepared by sintering at 50° C below the m.p. give the same results for the content of W as those prepared by briquetting, and the same calibration curve can be used. Cast samples of Fe - W alloys also give the same results if they are heated first at 1000° C for 3 to 4 hr. The method is recommended for the analysis of other binary alloys, in which the atomic numbers of the components differ sufficiently. G. S. SMITH

Moscow Steel Inst. im. I.V. Stalin

BOGDANOV, N.A., kandidat tekhnicheskikh nauk; REYTBLAT, V.L., inzhener; FUNKE, V.F., kandidat tekhnicheskikh nauk; ZHUKHOVITSKIY, A.A., professor, doktor khimicheskikh nauk.

Beta ray reflection and the analysis of metals. Sber. Inst.stali 34:283-305 '55. (MLRA 9:7)

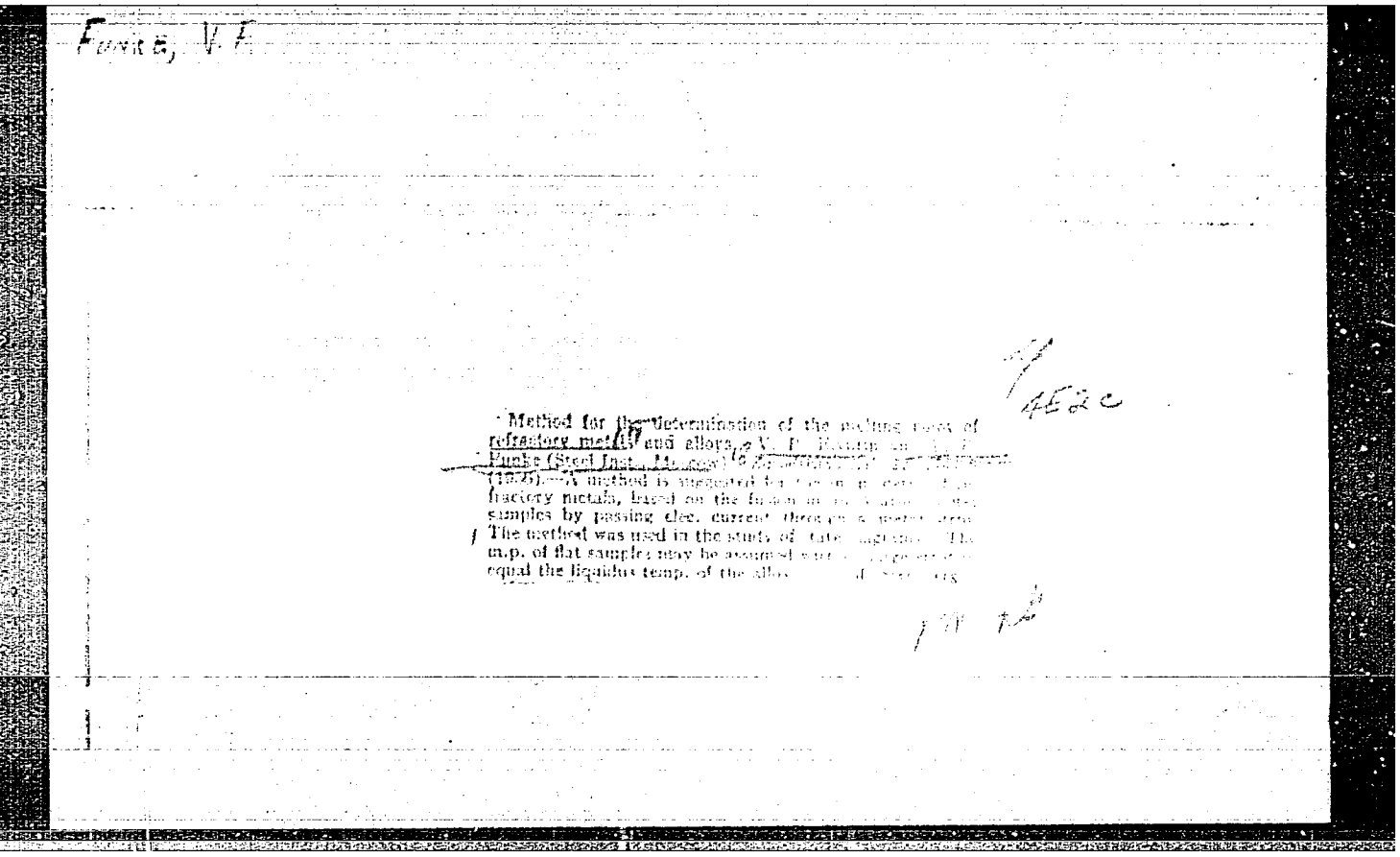
1.Kafedra fizicheskoy khimii i kafedra metallurgii redkikh metallov.
(Beta rays)

FOLKE, V.F.

The equilibrium diagram of the [illegible]

[illegible] contg 0.1[illegible] [illegible]
[illegible] Nb contg [illegible]
loys contg up to 70 at. % Nb were [illegible]
A [illegible] at 1800 [illegible]°, higher Nb [illegible]
sintering powd. Cr and [illegible]
below their m.ps. The [illegible]
equil. diagram were constructed from the [illegible]
d The existence of the $NbCr_2$ compd [illegible]
literature, was confirmed; two [illegible]
fused at 1660 and 1680°, for alloys [illegible]
% Nb. The Nb solv. in Cr at 1660° was [illegible]
1500° 4.25 at. %, and 1400° 3.7 at. %. The [illegible]
Nb is 20 at. % at 1660° and 12-13 at. % at 1500°.

W. M. [illegible]



Funke, V. F.

4520

Method for the determination of the melting points of refractory metals and alloys. V. F. Funke. Trans. Am. Soc. Steel Treating 11, [illegible] (1927). A method is suggested for the determination of the m.p. of refractory metals, based on the fusion of wire or ribbon samples by passing elec. current through a portion of the sample. The method was used in the study of [illegible]. The m.p. of flat samples may be assumed to [illegible] equal the liquidus temp. of the alloy [illegible]

FUNKE, V. F.

AUTHORS: Brokhin, I.S., Funke, V.F. 131-12-7/9

TITLE: Obtaining and Investigating Certain Properties of Ceramics From Silicon Nitride (Polucheniye i issledovaniye nekotorykh svoystv keramiki iz nitrida kremniya)

PERIODICAL: Ogneupory, 1957, Nr 12, pp. 562-566 (USSR)

ABSTRACT: According to published data the silicon-nitrogen system has three phases: Si_3N_4, Si_2N_3 and SiN, where the phase Si_3N_4 with 39.5% nitrogen is chemically the most stable and the most important in practice. Further, the properties of Si N are described in detail as also the method by which it is obtained from silicon powder, the chemical composition of which is shown in table 1. Figure 1 shows the saturation curves of silicon by nitrogen at various temperatures. Figure 2 shows the nitrogen content in silicon in dependence of the duration of nitration at 1600°. Table 2 shows the influence exercised by an addition of silicon upon the sintering of the silicon nitride (hot pressing at 1400° and 800 kg/cm²). In table 3 the properties of test samples of silicon nitride are described (Nitration temperature 1500°). Also bending strength and the resistance against oxidation were tested in dependence on temperature.

Card 1/2

131-12-7/9

The Discovery and Investigation of Certain Properties of Ceramics From Silicon Nitride

(See tables 4 and 5, as well as fig. 4). There are 5 figures, 5 tables, and 8 references, 2 of which are Slavic.

ASSOCIATION: All-Union Scientific Research Institute of Hard Alloys (Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov)

AVAILABLE: Library of Congress

Card 2/2

AUTHORS: K.A. Bystrova and V.F. Funke SOV/24-58-6-6/35

TITLE: Some Data on the Properties of Cemented Carbides with Non-uniform Distribution of the Cementing Phase (Nekotoryye dannye o svoystvakh tverdykh splavov s neravnomernym raspredeleniyem tsementiruyushchey fazy)

PERIODICAL: Izvestiya akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, 1958, Nr 6, pp 37-41 (USSR)

ABSTRACT: The strength of metal-ceramic alloys is determined by the thickness of the layers of the metallic material separating the carbide particles. Gurland and Bardzil (Ref 1) have shown that the properties of tungsten carbide bonded with cobalt can be varied within wide limits by suitable control of the grain size or the cobalt content. Meerson and Samsonov (Ref 2) showed that the strength of cemented carbides can be increased by utilising a non-uniform distribution of the carbide component. The increase in thickness of the Co layer surrounding the carbide particles resulting from the non uniform Co distribution enables an increase in strength to be obtained, without any reduction of the carbide content which would lead to impaired abrasion resistance. The results of the

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authors' experimental work permitted a correlation between the physical properties of the cobalt-bonded tungsten carbides and the degree of non-uniformity in the distribution of the cobalt phase. The non-uniform experimental alloys, all of which contained 6% Co, were prepared in the following manner: A master alloy VK2 (98% WC, 2% Co), prepared in sintered granular form, was mixed either with pure Co powder or with a powder mixture VK20 (80% WC and 20% Co) to give a final mixture containing 8% Co. After grinding in a ball mill for 6 to 48 hours, the cemented carbides were produced by hot pressing; a small proportion of the liquid phase was squeezed out during this operation leading to a final cobalt content of 6%. Alloys prepared in this way had a porosity of 0.2 to 0.4%. The uniformity of the cobalt distribution varied with the time of grinding, and photomicrographs in Figs 1 to 5 demonstrate the relationship between the grinding time and uniformity of cobalt distribution: the green VK2 + Co mixture ground for

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(a) 6 hours and (b) 12 hours, is shown in Fig 1. Unetched microsections of cemented carbides prepared from the VK2 + Co mixture ground for 6, 12, and 24 hours are shown in Fig 2. The microstructure of the cemented carbides prepared from the same mixture ground for 12 and 48 hours is shown in Figs 3a and 3b. The microstructure of the cemented VK2 + VK20 mixture ground for 6 hours is shown in Fig 4, while that of the hot pressed WC + Co mixture ground for 48 hours is reproduced in Fig 5. Other experimental alloys were produced by: (a) hot pressing a mixture of Co and WC powders (alloy VK6); sintering in hydrogen a mixture of Co and WC powders (alloy VK6A); standard procedure (alloy VK6V). From the microstructure of the experimental alloys prepared from the VK2 + Co mixture, it can be seen that a non-uniform distribution of cobalt was preserved provided the ball milling had not exceeded 12 hours. The following properties were investigated: apparent density of the product mixtures γ; bending strength σ; Rockwell hardness R_A; abrasion

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resistance K_{CT}; coercive force H_c; particle size distribution of the WC phase (percentage of fractions less than 1 μ, and between 1 and 2 μ). The results, tabulated on page 39, can be summarised as follows: the apparent density and the degree of non-uniformity of Co distribution decreased with the time of ball milling. The original non-uniformity of the VK2 + Co mixture was preserved provided that the ball milling had not been prolonged for more than 12 hours: the bending strength of these carbides was approximately twice that of the carbides VK6, VK6A, and VK6V. Neither hardness, nor the coercive force of the cemented carbides, was affected by the changes in the Co distribution. "Controlled" non-uniformity of the Co distribution resulted in an increase of the bending strength from 113 to 220 kg/cm^2 and also in a slight improvement of the abrasion resistance. These advantages were not obtained for the carbides prepared from the VK2 + VK20 mixture. If the cobalt distribution is uniform, the thin metal layers surrounding the carbide particles are in a stressed condition

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and cannot deform plastically and this leads to brittleness. Thicker Co layers reduced the stress concentrations and acted as cushions, thus increasing the plasticity of the alloy. The decrease of the apparent density of mixture VK2 + Co with grinding time is attributed to a decrease in size of the sintered carbide granules and a more uniform Co distribution. The effect of the Co content on the bending strength of alloys with "controlled" non-uniformity of the Co distribution was not studied. However, a graph (Fig 7) shows that an increase in the Co content from 4.5 to 6.2% brings about an increase in the bending strength from 120 to 220 kg/cm^2. This considerable increase in strength is attributed to

Some Data on the Properties of Cemented Carbides with Non-Uniform Distribution of the Cementing Phase

the fact that if the composition of the agglomerated WC phase (2% Co) remains constant, the degree of non-uniformity increases at a faster rate than the total cobalt content.
There are 10 photomicrographs, 2 graphs, 1 table and 3 references, of which 2 are Soviet and 1 English.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov (All Union Research Institute for Cemented Carbides)

SUBMITTED: April 16, 1957

AUTHORS: Brokhin, I. S., Funke, V. F. 78-3-4-2/38

TITLE: Investigation of the Solubility and Phase Composition in the System Silicon-Carbon (Issledovaniye rastvorimosti i fazovogo sostava v sisteme kremniy-uglerod)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 4, pp. 847-853 (USSR)

ABSTRACT: The solubility of carbon in silicon, the phase composition and the structure of silicon-carbon alloys as well as the problem of the dissociation of silicon carbide in vacuum at higher temperatures were investigated.
The investigation of the phase diagram in the system Si-C was carried out in three parts:
1.-Determination of the solubility of carbon in silicon;
2.-Determination of the phase composition in the range Si-SiC;
3.-Explanation of the formation of the SiC phase.
For the investigation of the phase composition and the structure of the alloys metallographic and x-ray structural analyses as well as the determination of microhardness were carried out.
The metallographic investigations showed that the alloys consist of one phase up to 0,7% C.

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Investigation of the Solubility and Phase Composition in the System Silicon-Carbon 78-3-4-2/38

The alloys containing more than 0,8% C consist of two phases: solid solution C in Si (light field) and silicon carbide (dark field).
In the thermal treatment of silicon carbide in vacuum at 2000--2100°C a complete dissociation of silicon carbide occurs with Si evaporating and C forming a graphite residue.
The graphite lines were proved by the x-ray structure analyses.
No solubility of Si was found in silicon carbide.
There are 14 figures, 3 tables, and 5 references, 2 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov, Moskva (Moscow, All-Union Scientific Institute for Hard Alloys)

Card 2/2

AUTHOR: Funke, V. F., Yelyutin, V. P. 78-3-4-6/38

TITLE: Some Data on Equilibrium Diagrams of Chromium-Niobium Systems(Nekotoryye dannyye k diagramme ravnovesiya sistemy khrom-niobiy)
Questions and Answers (Voprosy i otvety)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 4, pp. 866-867 (USSR)

ABSTRACT: Question :In publications data exist on the fact that at 1300° the cubic face-centered $NcCr_2$ ($HgCu_2$ type) phase changes to the hexagonal phase, which remains constant up to 1590°. What is your opinion on this fact ?
Answer: That refers to the diagram: tantalum-niobium, where the transition of one modification into the other is found. In the niobium- chromium system this cannot be observed any longer.
Question: What is the opinion on the accuracy of determining the liquidus- and solidus points and on the analysis of alloys?
Answer: That can easily be observed in the iron-aluminium system where the great crystallization intervals permit

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Some Data on Equilibrium Diagrams of Chromium-Niobium Systems

exactly to determine the temperature, to which the determination of the liquidus point in the fusion method corresponds. Here it can be determined that in the interval of 300° the lag of the temperature in liquidus can amount to 40 - 45°. That yields 10 - 15% of the temperature interval of crystallization of the alloy. For measuring temperature the thermocouple element is used in this case, which is connected with the molten part of the sample. Besides, here the cooling-down curve (Thermal analysis) is recorded. In determining the fusion temperature according to both methods a difference of 10 - 20° is found. After this the accuracy in determining the temperature of solidus in alloys, which must amount to ± 15%, is classified.

Question: How is it that you put in the chromium-niobium diagram such a low melting temperature for niobium = 2100° ?

Answer: The melting temperature of niobium lies higher, however this problem was out of question, since in the ex-

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Some Data on Equilibrium Diagrams of Chromium- Niobium Systems

periment no pure niobium, but 99,5% niobium with 5% tantalum content was used, because pure niobium was not present. (See article publ. in Izv. AN SSSR, OKhN, No. 3, 68 (1956))

FUNKE, V F.

79-1-59/63

AUTHORS: Funke, V. F., Samsonov, G. V.

TITLE: Synthesis and Some Properties of Silicon Nitride (Polucheniye i nekotoryye svoystva nitrida kremniya)

PERIODICAL: Zhurnal Obshchey Khimii, 1959, Vol.29, Nr 1, pp.267-272(USSR)

ABSTRACT: Three silicon nitrides were described in publications: Si_3N_4, Si_2N_3 and SiN (reference 1), but unequivocally the existence was only proved of Si_3N_4 (39,8 % nitrogen). According to the radiographic and electronographic analysis Si_3N_4 possesses a rhombic lattice with periods: a = 13,38 ± 0,03, b = 8,60 ± ± 0,2, c = 7,74 ± 0,02"A. Its specific gravity is 3,17 - - 3,44 gr/cm^3 and its melting point 1900°C. It is chemically of an extraordinary stability: hydrochloric, sulfuric, nitric and phosphoric acid of different concentrations in 500 hours treatment, chlorine at 900°C, H_2S at 1000°C, boiling 25 % soda lye are not capable of influencing this silicon nitride in any way. It is only under the influence of hydrofluoric acid that a decomposition takes place. It is well

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Synthesis and Some Properties of Silicon Nitride

resistant to molten metals: in molten aluminum (at 1000°C) it takes 100 hours to bring it to decomposition, in lead (at 400°C) 144 hours, in zinc (at 550°C) 500 hours, in magnesium (at 750°C) 20 hours. It is only in contact with molten copper that a corrosion markedly sets in. Regarding atmospheric oxidizability it also surpasses many an otherwise resistant compound. In the present paper two syntheses of silicon nitride described in publications were checked: 1) the azotation of the mixture of silica and charcoal in the nitrogen atom at elevated temperature and 2) the direct azotation of elementary silicon, also at high temperature. The latter was performed at 970 - 1600°C. The authors approximatly determined the reaction constant of the azotation and the activation energy in the reaction diffusion of nitrogen into silicon under formation of the phase Si_3N_4 (33800 ± 719 cal.mol). The authors calculated the microhardness of Si_3N_4. The solubility of nitrogen in silicon is low. The homogeneity-domain of the phase Si_3N_4 could not be determined. There are 4 figures, 2 tables, and 8 references, 2 of which are Slavic.

Card 2/3

SOV/180-59-2-8/34

AUTHORS: Baranov, A.I., Bystrova, K.A., Novikova, T.A., and Funke, V.F. (Moscow)

TITLE: The Influence of Molybdenum, Chromium and Aluminium on the Strength of Hard Alloys on a Nickel or Cobalt Base (Vliyaniye molibdena, khroma i alyuminiya na prochnost' tverdykh splavov na nikelevoy i kobal'tovoy osnove)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, Metallurgiya i Toplivo, 1959, Nr 2, pp 43-47 (USSR)

ABSTRACT: The influence of the alloying additions on the strength of WC-Co and WC-Ni alloys was investigated. Alloys containing 8, 10, 12 and 15% Co and 8% Ni were used. Various additions of Cr, Mo, and Al were added to the Co or Ni. (Cr Mo and Al form wide ranges of solid solution with Co and Ni). Alloys were prepared by sintering at 1400 to 1600 °C in a hydrogen atmosphere. X-ray analysis showed that Co in all the alloys had a cubic structure. The distribution of the alloying addition between WC and Co or Ni was determined by chemical analysis after extracting Co or Ni with HCl at 100 °C. The results are given in the table. Cr in WC-Co-Cr alloys is in solid solution with Co almost completely, but in WC-Ni-Cr

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The Influence of Molybdenum, Chromium and Aluminium on the Strength of Hard Alloys on a Nickel or Cobalt Base

alloys it is in the carbide phase. Mechanical strength was determined from bend tests and results showed that at room temperature the binary WC-Co and WC-Ni alloys have the highest strength. Addition of 20% Cr to the cementing phase results in a fall in strength of WC-Co alloys from 170 to 85 kg/mm^2 and of WC-Ni alloys from 140 to 110 kg/mm^2. At elevated temperatures the maximum strength is obtained by an alloying addition, the highest increase being shown by a Cr addition and the lowest by an Al addition. The highest strength is shown by alloys containing relatively small amounts of alloying addition (3-7%Cr, 3-7%Cr, 1-2%Cr). Further increases in alloying additions lead to decrease in strength and a large decrease in plasticity of the Co phase even at 600 - 800 °C. The effect of Cr, Mo and

SOV/180-59-2-8/34

The Influence of Molybdenum, Chromium, and Aluminium on the Strength of Hard Alloys on a Nickel or Cobalt Base

Al additions increases with total content of cementing phase.
There are 5 figures, 1 table and 9 references, 5 of which are English, two German and two Soviet.

SUBMITTED: November 27, 1958

Card 3/3

FUNKE, V.F.

66300

SOV/136-59-11-12/26

186100

AUTHORS: Deryagin, B.V., Yermin, V.N., Grechnyuk, N.L., Zakhavayeva, M.N., Filippovskiy, V.V., Funke, V.F. and Lopatina, A.M.

TITLE: Determination of the Specific Surface Area of Powders in the Production of Hard Alloys

PERIODICAL: Tsvetnyye metally, 1959, Nr 11, pp 55-60 (USSR)

ABSTRACT: This work has been carried out in order to see whether it is possible to determine more accurately the specific surface of powders by using relatively simple methods. The following gas porosity methods were used: Carman's method, using Poiseil's system of gas flow through a layer of powder, and B.V. Deryagin's method with Knudsen's (molecular) system. The results of the determination of the specific surface area by the gas porosity methods were compared with those of the methyl alcohol vapour adsorption method. The low temperature adsorption of nitrogen method used by Brunauer (Ref.1) was used as the control method for the determination of the specific surface area of powders of below 10μ grain size. The specific surface area of coarser powders was calculated from their

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S/137/62/000/002/046/144
A006/A101

AUTHORS: Blatov, V. D., Bystrova, K. A., Smirnov, F. F., Funke, V. F.

TITLE: On the problem of replacing cobalt by nickel in titanium-carbide tungsten-cobalt sintered carbides

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 2, 1962, 33, abstract 2G260 ("Sb. tr. Vses. n.-i. in-t tverdykh splavov", 1960, no. 2, 37-45)

TEXT: It was established that the decrease of mechanical and cutting properties of TiC-WC-Co sintered carbides when replacing Co by nickel, depends on the amount of structurally free WC. Maximum decrease is observed in grade T15K10 (T15K10) sintered carbides. With a higher TiC content the difference in the properties of sintered carbides with Co and Ni decreases; at 30% TiC (sintered carbide - $T_{30}K_4$) no reduction of physical, mechanical and cutting properties was observed. The operational strength of type T-15 sintered carbide with a coarse-grained T-phase is higher than that of a carbide with a fine-grained T-phase. Data were obtained on the effect of Ni_2O_3-reduction temperature

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S/137/62/000/002/046/144
A006/A101

On the problem of replacing cobalt ...

on the granularity of Ni-powder and on the effect of the particle size upon the properties of grade T 15H6 (T15N6) sintered carbide.

I. Brokhin

[Abstracter's note: Complete translation]

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DERYAGIN, B.V.; YERMIN, V.N.; GRECHNYUK, R.L.; ZAKHAVAYEVA, N.N.; FILIPPOVSKIY, V.V.; FUNKE, V.F.; LOPATINA, A.M.

Methods of determining powder dispersivity in the production of hard alloys. Sbor. trud. VNITTS no.2:158-171 '60. (MIRA 15:2)

(Powder metallurgy)
(Dispersimetry)

18.6100

82625
S/180/60/000/004/020/027
E193/E483

AUTHORS: Bystrova, K.A., Novikova, T.A. and Funke, V.F. (Moscow)

TITLE: The Effect of Alloying Additions on Structure and Properties of Tungsten Carbide-Cobalt Hard Alloys

PERIODICAL: Izvestiya Akademii nauk,SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, No.4, pp.124-128

TEXT: The object of the investigation described in the present paper was to determine the effect of chromium, molybdenum and aluminium additions on the grain size, transverse rupture strength and hardness of cobalt-bonded, sintered tungsten carbides. The experimental specimens contained 8, 12 or 15% Co, the content of the alloying additions introduced in the grinding stage varying between the following limits (wt. % of the cobalt content): Cr - 3 to 20; Mo - 3 to 20; Al - 1 to 8. Several conclusions were reached. (1) The grain size of the WC phase is reduced in the presence of chromium and molybdenum but is unaffected by addition ofaluminium. (2) With increasing content of Cr, Mo and Al the room temperature strength of the sintered carbide decreases, the decrease being largest in the case of chromium and smallest in

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E193/E483

The Effect of Alloying Additions on Structure and Properties of Tungsten Carbide-Cobalt Hard Alloys

the case of molybdenum addition. (3) Both chromium and molybdenum increase hardness of the cobalt-bonded tungsten carbide; the increase in hardness due to the presence of aluminium is slight and is observed only when small amounts (2 to 4%) of this metal are introduced into a carbide with a low (8%) cobalt content. There are 4 figures, 1 table and 8 references: 4 Soviet, 3 English and 1 German.

SUBMITTED: November 27, 1959

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FUNKE, V.F.

82635

S/126/60/010/02/005/020
E111/E352

18.1230 18.8100

AUTHORS: Funke, V.F., Shurshakov, A.N., Yudkovskiy, S.I., Kuznetsova, K.F., Shulepov, V.I. and Yurkevich, Yu.N.

TITLE: Electrical Resistance and Structure of WC-Co Alloys

PERIODICAL: Fizika metallov i metallovedeniye, 1960. Vol. 10, No. 2, pp 207 - 215

TEXT: Two-phase WC-Co alloys consist of hard, brittle tungsten-carbide grains and a cobalt-base plastic phase. Some workers consider that a continuous carbide "skeleton" exists (Ref. 1) and others (Ref. 2) that there is a continuous film of cobalt in alloys with over 2% weight Co. In the present work measurements of electrical conductivity were made to settle this point. Two-phase alloys with 0-100% were prepared by powder-metallurgy methods. Specimens were heated at 1 200 °C for 1.5 hours in hydrogen. Some were then cooled at 80 °C/hour to room temperature; others were quenched in oil at 20 °C. Fig, 1 shows specific conductivity as a function of cobalt concentration for quenched (Curve 1) and annealed (Curve 2) specimens. Plots of resistivity against temperature are shown in Fig. 2. X-ray examination was carried out (with type RKD and

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Electrical Resistance and Structure of WC-Co Alloys

URS-50 cameras) with cobalt radiation to find the alloy structure and the cobalt lattice dimension (the latter is shown as a function of WC weight % in Fig. 3). Another series of alloys with the same cobalt content (6% by weight) but different tungsten-carbide grain size (about 0.8 - 2.2 μ) was prepared and tested. Fig. 4 shows resistivity for annealed alloys as functions of coercive force (Curve 1) and of grain size (Curve 2): the relations obtained confirmed the conclusions from the other work, that there is a continuous layer of cobalt in alloys of this composition. The work showed that 0.5% Co is sufficient to break continuity of contact between carbide grains. No solubility of cobalt in carbide up to the eutectic melting point; eutectic transformation occurred at 1250 °C; solubility of carbide in cobalt was 12-13 weight % at 1200 °C. The reported (Ref. 11) loss in plasticity of the cobalt layer the authors attribute to lattice distortion at the cobalt/tungsten-carbide boundary surface.

There are 4 figures, 2 tables and 11 references: 6 Soviet, 4 English and 1 German.

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S/126/60/010/02/005/020
E111/E352

Electrical Resistance and Structure of WC-Co Alloys

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov
(All-Union Cermets Scientific-Research Institute)

SUBMITTED: January 6, 1960

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5.2100

S/080/60/033/04/13/045

AUTHORS: Funke, V.F., Yudkovskiy, S.I., Samsonov, G.V.

TITLE: Some Peculiarities of the Vacuum-Thermal Manufacture of Titanium Boride

PERIODICAL: Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 4, pp 831 - 835

TEXT: The effect of a charge increase on the condition of obtaining titanium diboride and also the content of impurities in the initial materials on the purity and the composition of boride is investigated here. Titanium diboride is formed by the reaction $2TiO_2 + B_4C + 3C \rightleftarrows 2TiB_2 + 4CO$. The initial materials were commercial titanium dioxide which contained (%) 59.65 Ti, 0.11 Fe_2O_3, 0.16 Al_2O_3, calcium, magnesium and boron carbide powder with 220 mesh. The reaction was carried out in a TVV-2 furnace with a graphite heater. It has been shown that the temperature and the holding time must be increased in order to obtain titanium boride of stoichiometric composition with a low content of carbon, if the charge is increased from 10 - 20 g to 100 - 200 g. At 1,400 - 1,500°C and a holding time of 2 - 3 hours titanium boride contains up to 1% carbon. At a temperature of 1,700°C and a holding time of 3 hours the titanium boride has a stoichiometric composition and the carbon content is only 0.26%. The higher is the content of carbon in the form of carbide, the less carbon must be introduced in the

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Some Peculiarities of the Vacuum-Thermal Manufacture of Titanium Boride

form of carbon black, which furthers the reaction of titanium boride formation to proceed more completely. Under the conditions of high temperatures and vacuum, evaporation of the impurities and intensive purification of boride takes place. Iron, silicon, aluminum, manganese and calcium are eliminated almost completely, the remaining impurities partially.
There are: 3 tables and 11 references, 6 of which are Soviet and 5 English.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov (All-Union Scientific Research Institute of Hard Alloys)

SUBMITTED: October 15, 1959

15.2400

30904
S/180/61/000/005/016/018
E202/E335

AUTHORS: Funke, V.F., Tumanov, V.I. and Trukhanova, Z.S.

TITLE: The effect of alloying on the structure and properties of tungsten carbide-cobalt alloys

PERIODICAL: Akadeniya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no. 5, 1961, 101 - 108

TEXT: The authors briefly describe the properties of the cermets WC-Co, TiC-WC-Co, WC-Ni and TiC-Ni in the first part of the paper and, in particular, the relations between the composition of the carbide phase and structure and properties of the above systems. The effect of the binding phase, i.e. Ni or Co, on the overall hardness and bending strength is also described [Abstracter's note: this part is largely a recapitulation of the data known in the West from such sources as Dawihl, Norton, Skaupy, Schwarzkopf, Kieffer et al]. The original contribution of the authors comprises studies on the effect of small additions of Cr, Al, Mo, Cu and CrB on the structure and properties of the WC-Co alloys. The alloying

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components were introduced to the mixture during grinding. The final analysis was carried out with the help of X-ray diffractometry of the sintered alloy and separate analysis of the binding and carbide phases. Separation of the phases was carried out electrochemically. The samples underwent bending tests and their hardness was measured (VPN) at 20, 600 and 800 °C. The chemical composition and lattice parameters of the binding and carbide phases are entered in Table 2. Whereas Cu and Al are both readily soluble in the binding phase in any quantity, their interaction with the carbide phase varies. Whilst 57% of the Al passes into the carbide phase, none of the Cu reacts with it. Mo and Cr distribute themselves between the carbide and binding phases which will contain some of the dissolved WC. It was also observed that, at room temperature, all the alloying elements with the exception of Cu, lower the bending strength of the WC-Co. This lowering is greatest with CrB, followed by Al, Cr and Mo. Cu additions up to 1% improve the bending strength. However, additions in excess of this figure lower both the strength and hardness of the WC-Co alloys.

The effect of alloying ....

The authors stress the fact that the alloying of the carbide phase should be effected with additives which, in addition to increasing the hardness and refractory properties of the carbide skeleton, will also improve its wettability with respect to the binding phase. The optimal conditions are reached when each grain of the carbide phase is fully wetted, i.e. when the carbide phase is discontinuous. On the other hand, the composition of the binding phase should cause a minimum lowering of the strength and plasticity of the alloy at the ambient temperature, while securing maximum possible strength at the working (i.e. high) temperature. The X-ray-diffraction studies were carried out by A.Ye. Koval'skiy and L.Kh. Pivovarov. There are 4 figures, 3 tables and 16 references: 11 Soviet-bloc and 5 non-Soviet-bloc. The four latest English-language references mentioned are: Ref. 3 - R.P. Felgar, I.D. Lubanh - Proc. Amer.Soc.Fest Mater., 1957, 58, 770-788; Ref. 9 - N.M. Parikh, J. Amer.Ceram.Soc., 1957, 40, 10, 335-339; Ref. 10; M. Himenik, N.M. Parikh, J. Amer.Soc., 1956, 39, 2, 60. Cermets 1; Ref. 14 - J. Phillips, L. Welfred,J. Inst. Metals, 1956, 984, v. 23, London. The Institute of Metals.

4

The effect of alloying ....

SUBMITTED: January 28, 1961

Table 2: Chemical composition and results of the X-ray diffraction study of the binding and carbide phases of WC-Co alloys.

Key:- 1 - Alloying component; 2 - Co, wt.%;
3 - Alloying component, wt.%;
4 - Content of binding phase; 5 - Alloying component; 6 - wt.%; 7 - at.%;
8 - Alloying component in carbide phase;
9 - Lattice parameters in kX; 10 - WC-phase;
11 - Solid solution based on cobalt (a);
12 - % on the basis of total content in the alloy.

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23432
S/121/61/000/006/009/012
D040/D112

181120 also 2908

AUTHORS: Funke, V.F., Romanov, K.F., Novikova, T.A., Guseva, A.N., and Bystrova, K.A.

TITLE: Wear resistance of W-Co hard-alloy cutter tips in machining EI437 alloy

PERIODICAL: Stanki i instrument, no. 6, 1961, 32-33

TEXT: Results are given of an experimental investigation with W-Co alloy-tipped cutters in turning cylindrical smooth and grooved blanks of ЭИ 437 (EI437) heat-resistant alloy. The experiments were performed on a Gustlow Werke lathe, using a cutting speed v=30 m/min, cutting depth t=1.0 mm and feed rates s of 0.6 and 0.3 mm/rev for continuous cutting (on smooth blanks); intermittent cutting (grooved blanks) was done with v=10 m/min, t=1.0 mm and s=0.2 mm/revolution, and with v=6 m/min, t = 1.0 mm, and s=0.6 mm/rev. Wear on the rear face of the tips was used as a criterion of the wear. The results are illustrated in four graphs (Fig. 1-4). It was established that 8% Co gave the maximum wear resistance and hardness. A Co content lower than 8% gave lower wear resistance on account of insufficient alloy strength (the cutting edge crumbled), and higher than 8% also resulted in lower wear resis-

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Wear resistance of W-Co ...

tance on account of insufficient hardness. A lower feed rate facilitated cutting and raised wear resistance. It was concluded that the cutter tips used for machining EI437 alloy must have higher strength than those used for cutting cast iron or steel. The maximum wear resistance for continuous cutting of EI437 is shown by cutter tips with 8% Co; for intermittent cutting of cast iron and steel the Co content in W-Co alloy cutting tips must be lower. There are 4 figures and 2 Soviet-bloc references.

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S/180/61/000/006/017/020
E073/E535

AUTHORS: Tumanov, V.I., Funke, V.F., Baskin, M.L. and Novikova, T.A. (Moscow)

TITLE: Physical properties of the alloys tungsten carbide-cobalt

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo No.6, 1961, 144-148

ABSTRACT: Systematic data on the physical properties of [illegible] alloys have not been published and, therefore, the authors have investigated the specific resistance, the Young modulus, the coefficient of linear expansion and the hardness of WC-Co alloys containing various quantities of the binder phase with various sizes of the tungsten carbide grains. For the tests, specimens containing 0 to 100% Co and specimens containing 6 wt.% Co were investigated, differing as regards the size of the tungsten carbide grain. The alloys were produced according to standard technology. The main series of alloys with various contents of binder had a practically equal average diameter of the tungsten

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carbide grain of 2.5 μ. The phase composition of the alloys throughout the entire range of changes of the Co content remained constant: phase WC plus solid solution of tungsten and carbon in cobalt. The porosity of the alloys did not exceed 0.2 vol.%; the tungsten carbide had a porosity of 3.5%. The sintered specimens were quenched and annealed; the quenching consisted of heating in a hydrogen atmosphere at 1000°C for 12 hours and cooling in the water-cooled cooler of the furnace. The annealing was at 1000°C for 12 hours in a hydrogen atmosphere followed by cooling to 800°C and holding at that temperature for 24 hours and then cooling to room temperature at an average rate of [illegible] °C/min. The specific resistance ρ, the modulus of elasticity E, the coefficient of linear expansion α and the hardness H_V were determined on quenched and annealed specimens. The specific electric resistance was determined by the compensation method using a potentiometer, the maximum error being 2.0%; the coefficient of linear expansion was determined with a quartz rod dilatometer in the range 18 to 420°C with an error of 2.5%; the Young modulus was determined by a dynamic method with

an error of 1%. Fig.1 shows the dependence on the cobalt content, wt.% of the following: specific resistance ρ, μohm·cm (a); modulus of elasticity E, kg/mm^2 and the coefficient of linear expansion α, 1/deg (б); hardness H_v, kg/mm^2 (в). Curves 1 and 3 - after quenching, curves 2 and 4 - after annealing. The obtained experimental results show that the specific electric resistance is the most sensitive physical characteristic of WC-Co alloys which provides an indication of the state and the composition of the binding and the carbide phases and of the structure. The modulus of elasticity and the coefficient of linear expansion indicate predominantly the quantitative relations between the tungsten carbide and the cobalt in the alloy and depend little on heat treatment and composition of the binding phase. The modulus of elasticity changes considerably with the grain size of the tungsten carbide. The results confirm the view of the existence of a continuous cobalt phase in alloys of this type. L. G. Grigorenko and A. A. Cheredinov participated in the experiments. There are 2 figures and 4 references: 2 Soviet-bloc and 2 non-Soviet-bloc. The English-language references read as follows: Ref.1: Dawihl W. and Hinnuber J. The structure of hard metal alloys. Kolloid-Z.,

Physical properties of ... S/180/61/000/006/017/020
E073/E535

1943, 104, No.2/3, 233; Ref.2: Gurland J. and Norton J. Role of the binder phase in cemented tungsten carbide-cobalt alloys. Metals, 1952, 4, No.10, 1051.

SUBMITTED: June 18, 1961

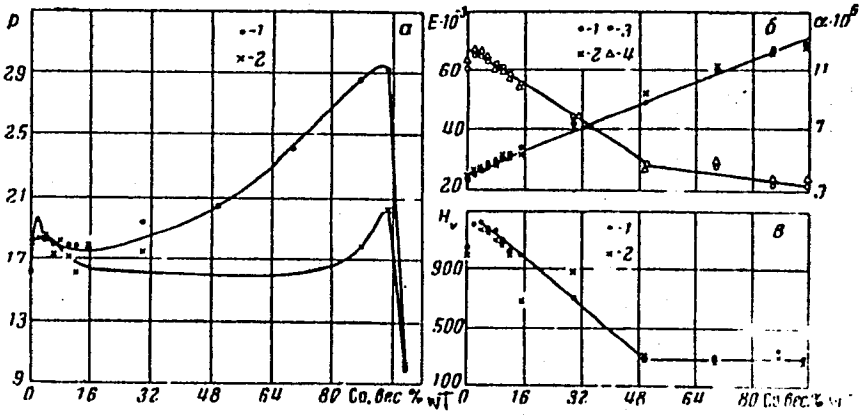

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Fig.1

30453
S/126/61/012/003/008/021
E073/E535

15 2240

AUTHORS: Funke, V.F., Panov, V.S. and Yudkovskiy, S.I.

TITLE: Structure and the physical and mechanical properties of TiC-WC-Co carbides

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.12, No.3, pp.382-388

TEXT: The results are given of investigations of the structure of TiC-WC-Co carbides and of their properties as a function of the composition and heat treatment. Two series of carbides with cobalt contents between 0 and 30 wt.% and a constant content of the carbide phase in each of the series were investigated. (Yu. A. Skudin and K. F. Kuznetsova participated in the experiments). In the first series the content of titanium carbide was about 16%, in the second about 64% of the carbide phase. In the first case the carbide phase consisted of structurally free tungsten carbide and a saturated solution of WC and TiC; in the second, the carbide phase consisted of a solid solution of WC and TiC. The carbides were prepared by current methods; carbides with up to 1% Co were produced by hot pressing. The sintered specimens did not have any

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pores and did not contain structurally free carbon. The carbides were homogenization annealed for two hours at 1200°C in a hydrogen atmosphere and cooled jointly with the furnace at a rate of 40 to 50°C/hour down to room temperature. Following that, the specimens were heated to 1200°C, held at that temperature for two hours, and quenched in oil at 20°C. The grain size of the WC phase and of the solid solution of WC in TiC remained practically unchanged on changing the cobalt content and during heat treatment. The average grain size of the WC phase was 2.28 μ, that of the TiC phase was 2.5 μ in the first series and 3.0 μ in the second series. The sintered, annealed and quenched specimens were subjected to metallographic and X-ray analyses and, in addition, the electric resistance, the microhardness and the bending strength were determined. Particular attention was paid to obtaining data on the relation between the specific electric resistance of two and three-phase TiC-WC-Co carbides on the one hand, and the Co content and the heat treatment conditions on the other hand. These data indicate that cobalt is soluble in the titanium carbide phase, which, in the case of the ratio TiC/WC = 0.19, is about 2% at 1200°C. If structurally free tungsten carbide is present, the

Co, vol.%, are plotted in Fig.3 (1 - tungsten-cobalt carbides, 2 - titanium-tungsten-cobalt carbides (TiC/WC = 0.19), 3 - titanium-tungsten-cobalt carbides (TiC/WC = 1.765)). Fig.4 is a plot of the dependence of the hardness, HV, kg/mm^2 on the cobalt content, wt.% (1 - TiC/WC = 1.765; 2 - TiC/WC = 0.19; Δ - sintered, X - annealed, O - quenched). It can be seen that for both two-phase and three-phase WC-TiC-Co carbides the hardness increases almost linearly with increasing cobalt content and is almost independent of the heat treatment and the composition of the bonding phase. There are 4 figures and 12 references: 6 Soviet and 6 non-Soviet. The English-language references read as follows: Ref.2: Gurland, I., Norton, I., J.Metals, 1952, 4, No.10, 1054; Ref.11: Gangler, I., J. Am.Cer.Soc., 1950, 33, 367.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov (All Union Scientific-Research Institute for Carbides)

SUBMITTED: November 28, 1960 (initially)
May 25, 1961 (after revision)

titanium phase will be subjected to tensile stresses. Fig.1 shows a plot of the specific electric resistance, ρ, μohm·cm, of Ti-WC-Co carbides as a function of the cobalt content (wt.%). Two sets of materials were used with the following heat treatments: TiC/WC = 1.765: 1 - sintered; 2 - annealed; 3 - quenched. TiC/WC = 0.19: 4 - sintered; 5 - quenched, 6 - annealed. A sharp drop in the electric resistance caused by an increase of the Co content from 0 to 4% is attributed to the relief of the thermal stresses of the carbide phase as a result of increasing the content of the ductile component, which leads to a stress relaxation and to a reduction of the concentration of tungsten carbide in the solid solution TiC-WC on increasing the cobalt content from 0 to 1%. An increase in the electric resistance for carbides containing over 4% Co is attributed to the fact that the specific electric resistance of the carbide phase is lower than that of the bonding phase and, consequently, an increase in the quantity of the latter is accompanied by an increase of the electric resistance of the carbide as a whole. Data on the dependence of the bending strength, σ, kg/mm^2, on the composition,

FUNKE, V.F.; ROMANOV, K.F.; NOVIKOVA, T.A.; GUSEVA, A.N.; BYSTROVA, K.A.

Durability of tips made of tungsten-cobalt hard alloy used in the machining of the EI437 alloy. Stan.i instr. 32 no.6:32-33 Je '61. (MIRA 14:6)

(Metal-cutting tools)
(Cobalt-tungsten alloys)

FUNKE, V.F.; YUDOVSKIY, S.I.; SAMSONOV, G.V.

Alloys of the system B, Ti, Fe. Zhur. prikl. khim. 34 no.5: 1013-1020 My '61. (MIRA 16:8)

(Boron-titanium-iron alloys)

37732

S/180/62/000/002/011/018
E040/E135

18.1152

AUTHORS: Funke, V.F., Novikova, T.A., and Tumanov, V.I.
(Moscow)

TITLE: Structure and properties of tungsten-carbon-cobalt-molybdenum alloys

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no.2, 1962, 113-118

TEXT: The results are reported of an investigation of the phase composition, chemical composition and structure of the W-C-Co-Mo alloys with 80 and 47% W contents. Special attention was paid to the changes in the alloy properties as a result of variation in their Mo and C contents. Alloys with 80% W (remainder carbon and cobalt) were found to be suitable for many industrial purposes and those with 47% W find application in X-ray structural analysis of the cobalt-base solid solutions. The test specimens were prepared by powder metallurgy techniques, starting with powders of W, Co and Mo,

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by pressing and sintering at 1450 °C (for alloys with 80% W) and 1250 °C (for alloys with 47% W). The above sintering conditions were found to give alloy specimens with the highest density and the best ultimate bending strength. The specimens were then annealed at 1200 and 1000 °C for 2 hours and at 800 °C for 24 hours and allowed to cool, together with the furnace, at the rate of about 1.5 °C/min. The ultimate bending strength was measured at 20 and 800 °C and the hardness of the test alloys was determined at temperatures in the range of 20 to 1000 °C. In addition, determination of the phase composition of the alloys was made by means of X-ray structural and chemical analyses. Special analysis was made of the cobalt and carbide phases. An increase in the Mo content of the test alloys, while the tungsten and carbon content are kept constant, was found to produce a change in the phase composition of the alloys. According to metallographic analysis, the two-phase structure is retained by alloys with 80% W when the molybdenum content is raised from 0 to 1.5%, the two phases being tungsten carbide and a cobalt-base solid solution. At a molybdenum content of 3% or higher, a

third phase was found to appear. The structure of this phase was found to be identical with that of the η_1-phase present in the W-C-Co system (double carbide of tungsten and cobalt). The quantity of this third phase was found to rise with increasing molybdenum concentration. In the alloys with 47% W, the third phase appears at molybdenum contents exceeding 10%, but an increase in the carbon content at a constant molybdenum concentration leads to a reduction in the quantity of the third phase. At the carbon content of 5.36% or more, the test alloys with 80% W and about 3.5% Mo were found to have two phases only: WC phase and the cobalt phase. In the alloys with 47% W content and 10% Mo, the third phase does not form if the carbon content is increased to 4.3%. Phase composition analysis of the test alloys showed that if molybdenum is at concentrations up to 10%, a two-phase structure can exist in the alloy with 47% W. This is taken as an indication of the presence of a solid solution region of molybdenum and carbon in the tungsten carbide phase. It was found that the introduction of molybdenum in the alloys of the W-C-Co system, the raising of molybdenum content up to

3% and the resultant appearance of the double carbide (η_1-phase), as well as a change in the composition of the WC and Co-phases, are accompanied by some reduction of strength at room temperature and some increase of the strength at 800 °C. The hardness of the W-C-Co-Mo alloys is greater than that of the W-C-Co alloys of equal strength.
There are 7 figures and 2 tables.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov
(All-Union Scientific Research Institute for Hard Alloys)

SUBMITTED: September 18, 1961

FUNKE, V.F. (Moskva); YUDKOVSKIY, S.I. (Moskva); Prinimala uchastiye VODYANAYA, T.A.

Structure and properties of alloys of zirconium diboride with iron, cobalt, and nickel. Izv.AN SSSR. Otd.tekh.nauk. Met.i topl. no.4:126-132 Jl-Ag '62. (MIRA 15:8)
(Zirconium alloys--Metallography) (Powder metallurgy)

S/180/62/000/006/002/022
E111/E451

AUTHORS: Tumanov, V.I., Funke, V.F., Belen'kaya, L.I., Usol'tseva, L.P. (Moscow)

TITLE: Influence of alloy additions on the surface tension of metals of the iron group

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no.6, 1962, 43-48

TEXT: The effect was investigated of alloy additions to nickel and cobalt on surface tension and weldability of alumina by them; the alloy additions studied were molybdenum, tungsten, titanium, copper, tungsten carbide and titanium carbide. The sessile drop method was used at a vacuum of 10^{-5} mm Hg and temperatures of about 1500°C (1400°C copper). Over the alloying range studied (0.5 to 20 at.%), a relationship was found between, on the one hand, the contact angle, surface tension, interfacial tension and work of adhesion and, on the other, the atomic diameter and thermal stability of the oxides of the alloy additions. With the carbides the greatest reduction in the contact angle and increase in the work of adhesion was obtained when 5% TiC was introduced into cobalt

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Influence of alloy ...

(the values then being 62°C and 3600 erg/cm^2, respectively). X-ray structural investigation was made of the contact zone between the alumina plate (made by sintering 99.4% Al_2O_3 in argon for 5 hours at 1950°C to give a porosity of 0.2%) and the alloy. Spinel formation was found to extend to a considerable depth with cobalt. With nickel, α-Al_2O_3 and $NiAl_2O_4$ were found on the plate at a point adjacent to the drop and α-Al_2O_3, $NiAl_2O_4$, TiC, TiO_2 and NiAl on the plate at the contact zone; $NiAl_2O_4$, Ni, TiC, TiO_2 and NiAl were found in the molten drop at the contact zone. Thus the interfacial activity of titanium is evidently due to a reaction between the liquid metal and the solid alumina. There are 5 figures and 5 tables.

SUBMITTED: March 16, 1962

Card 2/2

45258

S/226/62/000/006/009/016
E193/E383

18.1152

AUTHORS: Funke, V.F., Yudkovskiy, S.I. and Panov, V.S.

TITLE: A study of the structure and physical properties of alloys of the TiC-WC-Co system

PERIODICAL: Poroshkovaya metallurgiya, no. 6, 1962, 61 - 66

TEXT: The effect of the Co content and heat-treatment on the structure and properties of three series of WC-base alloys was studied. The W content of each series varied between 0 and 30%; alloys of the first series contained WC only, those of the second and third series containing 16 and 64% TiC, respectively. Conventional methods were used for the preparation of experimental specimens, hot pressing being used in the preparation of Co-free compacts. The specimens were free from pores and did not contain structurally-free carbon. X-ray diffraction analysis and measurements of hardness and electrical resistance were conducted on specimens a) as sintered, b) annealed for 2 h at 1 200 °C and furnace-cooled to room temperature and c) oil-quenched from 1200 °C after 2-h holding at the temperature. X-ray diffraction analysis has shown that the carbide phase in the WC-Co alloys is under

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A study of ....

compressive stresses, whereas TiC in the ternary alloys containing structurally-free WC is under tensile stresses. Other results are reproduced graphically in Fig. 1; the electrical resistivity (ρ, Ω cm) is plotted against the Co content (vol. %) in WC-Co alloys (bottom graph) and ternary alloys with 16 and 64% TiC (T15 and T60, respectively, top graph); the curves marked 'закалка', 'спекание' and 'отжиг' relate, respectively, to quenched, sintered and annealed specimens. In Fig. 2, the bending strength ($\sigma_{изг}$, kg/mm^2 - continuous curves) and Vickers hardness (H_V, kg/mm^2 - broken curves) are plotted against the Co content (vol. %) in sintered alloys, containing no titanium carbide (BK) or with a titanium carbide of 16 and 64% (curves T15 and T60, respectively). There are 2 figures and 1 table.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov (All-Union Scientific Research Institute of Hard Alloys)

SUBMITTED: April 14, 1962

Card 2/3

A study of ....

S/226/62/000/006/009/016
E193/E383

Fig. 1:

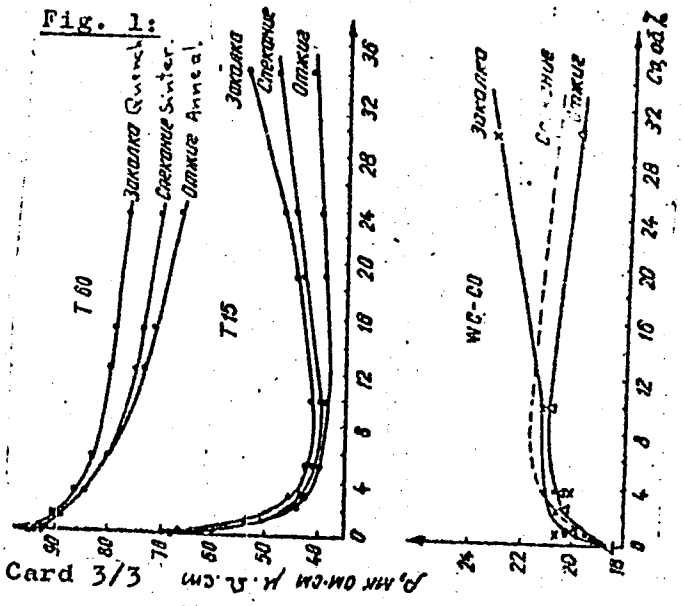

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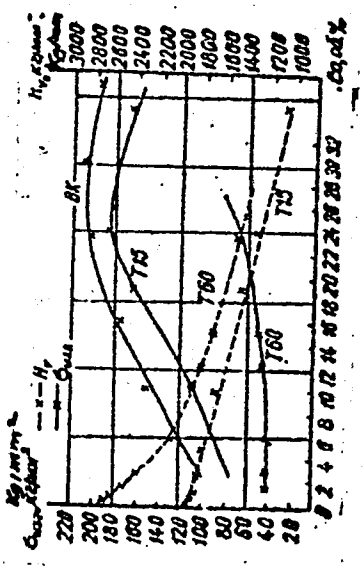
Fig. 2:



42022
S/695/62/008/000/013/028
I048/I248

15.2420

AUTHORS: Funke, V.F., Tumanov, V.I., and Trukhanova, Z.S.

TITLE: Effect of alloying on the structure and properties of tungsten carbide - cobalt cerments

SOURCE: Akademiya nauk SSSR. Institut metalurgii, Issledovaniya po zharoprochnym splavam. v.8. 1962. 88-95

TEXT: The contact angle (θ) between WC and molten Co or Ni (measured by the sessile drop method) is 0^{o}, i.e., complete wetting takes place. Addition of TiC to the WC reduces the tendencies of the molten metals to spread and the contact angles increase, e.g., to 21^{o} for the system Co - WC containing 23.6% TiC. Substitution of TiC for part of the WC in WC-Co cermets reduces both the bending strength and the hardness of the cermets. Increasing the Co content in both WC-Co and WC-TiC-Co cermets causes an increase in bending strength, up to a certain maximum which is about 200 kg./sq.mm. in the case of WC-Co containing above 24% Co; this strengthening action of the Co is associated with the increased plasticity of cermets

Card 1/3

Effect of alloying on the structure...

containing larger amounts of Co. The addition of various alloying components affects both the structure and the properties of WC-Co cermets. Thus, the Co phase of the cermet contains 1.28% WC in the absence of alloying components, 1.95, 0.4, and 2.13% WC when 2.09% Cr, 2.43%CrB, and 11.1% Mo respectively are added, and no WC when 1.83% Cu or 2.81% Al is added. The presence of the alloying components causes slight variations in the lattice parameters of both the WC and Co phases. The distribution of these components between the WC and Co phases is fairly balanced, except in the cases of CrB (98.5% of which concentractes in the WC phase) and of Mo and Cu (95.5% and 100% respectively concentrate in the Co phase). All alloying elements mentioned, except Cu in small quantities (about 1%), reduce the bending strength of the cermets at room temperature; at high temperatures (600-800°), however, addition of Mo, Cr, Al, and CrB increases the strength. The additions of Mo, Cr, or CrB causes an increase in both the ambient-temperature and high tem-

S/659/62/008/000/013/028
I048/I248

Effect of alloying on the structure...

perature hardness of the cermets, while the addition of Al causes a decrease in same. There are 4 figures and 3 tables.

Card 3/3

GORELIK, S.S.; YELYUTIN, V.P.; MOZZHUKHIN, Ye.I.; URAZALIYEV, U.S.; FUNKE, V.F.

X-ray investigation of recrystallization processes of titanium, zirconium, and molybdenum borides, and titanium and tungsten carbides. Izv. vys. ucheb. zav.; tsvet. met. 5 no.4:143-148 '62. (MIRA 16:5)

1. Moskovskiy institut stali, kafedry redkikh metallov, fiziki metallov i rentgenografii.
(Borides) (Carbides) (Crystallization)

FUNKE, V.F.; SHULEPOV, V.I.; YUDKOVSKIY, S.I.

Dependence of the electric resistance of WC-Co alloys on their structure. Fiz. met. i metalloved. 13 no.5:794-795 My '62. (MIRA 15:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut tverdykh splavov.

(Tungsten-cobalt alloys--Electric properties)